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ROTATION OF THE PLANE OF POLARIZATION BY MIXTURES.

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The experiments described in this paper were suggested by Prof. James S. Stevens, and carried on by the writer during the past year. They had for their general object an investigation of the rotation of the plane of polarization by mixtures, as compared with that produced by the separate ingredients. A Laurent polaristrobometer was used, the special feature of which is a semi-circular plate of quartz which serves to retard half of the rays, so that under certain well-understood conditions there is an equal illumination of the field. The source of light used was a sodium flame produced by saturating the wick of a large alcohol lamp with common salt.

Assuming the truth of the law connecting the degree of rotation with the tube length, the first part of the experiment consisted in determining whether the apparatus available was sufficiently accurate for the proposed investigation. A triangular trough with one angle very small was made water-tight and covered on two sides with strips of paper perforated at equal distances. It was proposed by sighting through opposite apertures to measure the rotation due to a sugar solution, whose thickness increased as one passed from the apex to the base of the triangle. It was found, however, that the refractive effect of the glass sides, which could not, of course, be placed parallel to each other, prevented the field from being observed.

A more satisfactory method consisted in taking a piece of hard glass tubing, 2·51 cm. outside, and 2·15 cm. inside diameters, and cutting as great a length as could be used in the instrument, and cementing plates of glass over each end. *Fig. 1* shows the arrangement indicated. The cement used was melted asphalt, commonly known as "sidewalk pitch." It would be difficult to find a more perfect cement for glass than this substance; it is water proof,

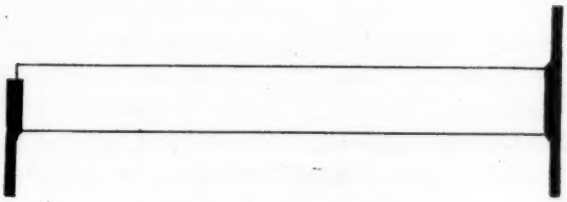

FIG. 1a.—Side view.

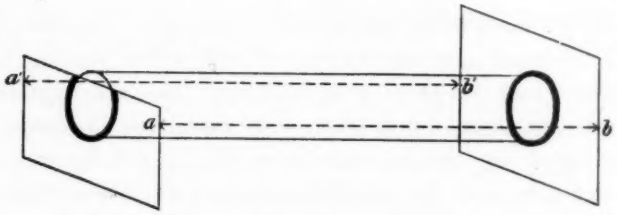

FIG. 1b.—General view of tube.

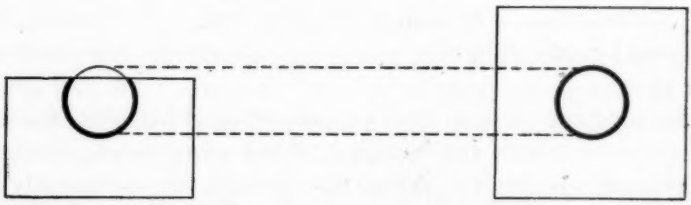

FIG. 1c.—Direct end views of tube.

and many of the common chemicals do not affect it. Another variety, known as "roofing pitch" is good, but more viscous, and not so well adapted for permanent strain.

A solution of glucose was placed in this tube and the end cemented on, leaving a small space as shown in the figure. Through this space the liquid could be introduced by means of a pipette, and when once filled the surface tension was sufficient to retain it.

The amount of rotation was next observed, and the tube unsealed at one end and cut down about 1 cm., refilled, and the process repeated. Observations for twelve lengths of tube were taken, and when plotted with the corresponding rotations, gave a fairly straight line, but the results were not considered sufficiently accurate.

In order to obtain the best possible results, a series of tubes, sixteen in number, was constructed, differing from each other by irregular intervals of length. These could be tested repeatedly and afforded a check on the work. To find their lengths, measurements were taken on two sides and the mean taken. The following table will show the method of procedure:

TABLE I.—LENGTH OF TUBES.

No. of Tube.	Length of *a b*.	Length of *a' b'*.	Mean (weight 1).	Length of *a b*.	Length of *a' b'*.	Mean (weight 2).	Final Average.
	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.	Cm.
1	0.44	0.41	0.425	0.43	0.41	0.420	0.42
2	0.76	0.85	0.805	0.86	0.76	0.810	0.81
3	1.04	1.00	1.020	1.01	1.04	1.025	1.02
4	1.47	1.34	1.405	1.45	1.32	1.385	1.39
5	1.78	1.90	1.840	1.90	1.77	1.835	1.84
6	3.42	3.48	3.450	3.41	3.48	3.445	3.45
7	5.11	5.20	5.155	5.20	5.10	5.155	5.15
8	6.43	6.51	6.470	6.51	6.42	6.465	6.47
9	8.16	8.13	8.145	8.16	8.11	8.135	8.14
10	9.84	9.72	9.780	9.72	9.80	9.760	9.77
11	11.54	11.57	11.555	11.57	11.52	11.545	11.55
12	13.27	13.30	13.285	13.30	13.27	13.285	13.29
13	15.05	15.15	15.085	15.13	15.08	15.105	15.10
14	16.89	16.85	16.870	16.82	16.88	16.850	16.86
15	18.38	18.41	18.395	18.41	18.38	18.395	18.40
16	19.63	19.75	19.690	19.75	19.61	19.680	19.68

The next table shows the amount of rotation afforded by a solution of glucose in each tube. The table is printed in full in order to show the degree of precision obtained in making the readings.

TABLE II.

No. of Tube.	Readings.										Mean.	Corrected for Zero Error.
1	0°9°	0°8°	0°8°	0°9°	0°8°	0°8°	0°8°	0°8°	0°8°	0°7°	0°81°	0°35°
2	1.0	1°1	1°0	1°0	0°9	1°1	1°0	1°0	1 0	1°1	1°03	0°57
3	1°4	1°2	1°1	1°3	1°1	1°4	1°3	1°2	1°1	1°1	1°22	0°76
4	1°6	1°6	1°5	1°3	1°4	1°4	1°5	1°5	1°2	1°4	1°44	0 98
5	1°9	1°8	1.5	1°8	1°7	1°7	1°6	1°6	1°9	1°6	1°72	1°26
6	2°8	2°6	2°8	2°8	2°6	2°6	2°7	2°9	2°7	2°8	2 73	2°27
7	3°9	3°8	4°0	4°0	3°8	4°0	4°1	4°0	4°0	3°8	3 94	3 48
8	4°7	4°7	4°7	4°7	4°7	4°8	4°6	4°9	4°8	4°7	4°75	4°29
9	5°7	5°9	5°8	6°0	5°8	5°8	5°8	5°8	5°7	5°7	5°80	5°34
10	7°0	7°0	6°9	7°0	7°1	6°9	6°9	7°0	7°1	6°9	6 93	6°52
11	8°0	7°9	8°0	8°0	8°3	8°0	8°0	8°2	8°1	8 2	8°07	7°61
12	9°4	9°3	9°2	9°5	9°3	9°2	9°3	9°2	9°6	9°4	9 34	8°88
13	10°5	10°5	10°4	10°7	10°5	10°6	10°5	10°5	10 6	10°5	10°53	10°07
14	11°6	11°7	11°7	11°6	11°7	11°7	11°7	11°7	11°6	11°5	11°65	11°19
15	12°6	12°6	12°5	12°6	12°8	12°6	12°6	12°7	12°4	12°6	12°60	12°14
16	13°5	13°5	13°4	13°4	13°7	13°7	13°7	13°3	13°4	13°4	13 50	13°04

The curve which was obtained by plotting the tube-lengths and rotations as coördinates is shown below. It is so close an approximation to a straight line that the accuracy of the methods employed in the subsequent work may be regarded as established. (See *Fig. 3.*)

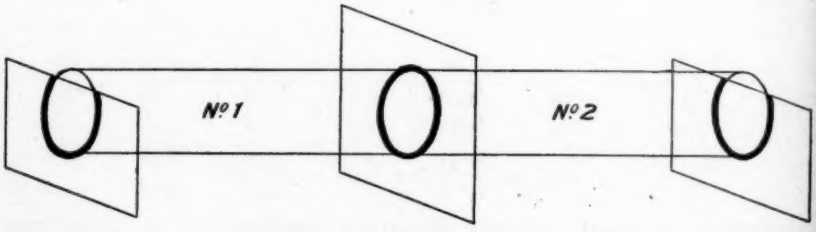

FIG. 2.—The double tube.

The next part of the work consisted in determining whether two rotating liquids in tubes placed end to end will produce an effect equal to the sum of the rotations of each liquid separately. For the sugar solutions a double tube was constructed as represented in the figure. (See *Fig. 2.*)

The two parts of the tube are referred to as No. 1 and No. 2. Their lengths were made as nearly equal as possible, but a cane sugar test showed that No. 1 rotated the plane 17°.83 and No. 2

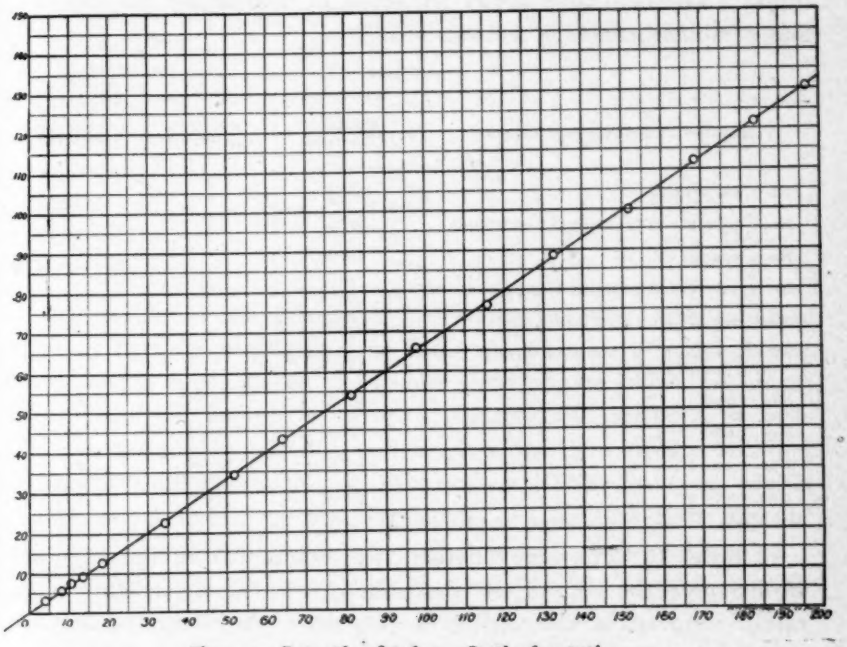

FIG. 3.—Length of tube. Optical rotation.

17°.79. Their ratios were, therefore, 1 : 1.002. The following table gives some of the results of this work:

TABLE III.

Liquid.	Rotation Observed.	Rotation Calculated.	Per Cent. of Deviation.
Granulated sugar sol. tube No. 1.	10°.54		
Grape sugar sol. tube No. 1.	7° 99		
Cane sugar sol. tube No. 2.	17°.79		
Cane sugar sol. tube No. 1.	17°.83		
Grape sugar No. 1. / Cane sugar No. 2.	25°.83	25°.78	0.2
Granulated sugar No. 1. / Cane sugar No. 2.	28°.44	28° 40	0.1

In making the test for oils it was found that enough of the pitch was dissolved to render the liquid somewhat opaque. Ordinary

bottles covered with perforated paper answered the purpose very well, and in the results which follow, the short tube belonging to the saccharimeter was used with a bottle containing the second liquid. The next tube shows the result of comparing the separate and combined effects of various oils.

TABLE IV.

Number and Name of Substance.	Rotation Observed.	Rotation Computed.	Per Cent. of Deviation.
No. 1, turpentine.	—6°·30		
No. 2, mixture of turpentine and orange.	64°·42		
No. 3, orange oil.	24°·94		
No. 4, mixture of nutmeg, orange and mint.	17°·60		
No. 5, orange oil (small bottle).	13°·55		
No. 6, mixture of nutmeg, orange and mint (small bottle).	9°·43		
Nos. 1 and 3.	18°·72	18°·64	0·3
Nos. 1 and 5.	7°·16	7°·25	0·4
Nos. 2 and 4.	81°·97	82°·02	0·1
Nos. 2 and 6.	73°·39	73°·85	0·6

In order to determine whether two substances mixed together would give the sum of the rotations due to the ingredients separately, solutions of the various sugars were placed in the double tube, and results reached as follow:

TABLE V.

Substance.	Rotation Observed.	Rotation Calculated.	Per Cent. of Deviation.
Tube 1, grape sugar.	7°·99		
Tube 2, cane sugar.	17°·79		
Mixture.	12°·85	12°·89	0·3

The calculated rotation was obtained by remembering that the relative lengths of the parts of the double tube were 1 : 1·002.

$$\frac{1\cdot002}{2\,002} \times 7°\cdot99 = 4°\cdot007$$

$$\frac{1\cdot000}{2\cdot002} \times 17°\cdot79 = 8°.886$$

$$4°\cdot007 + 8°\cdot886 = 12°\cdot89$$

A similar method was employed with the oils, the results of which are shown below.

TABLE VI.

Substance.	Number.	Rotation Observed.	Rotation Calculated.	Per Cent. of Deviation.
Orange oil.	1	86°·91		
Nutmeg oil.	2	21°·58		
Mixture of 1 and 2.		53°·77	54°·24	0·9
Turpentine.	3	12°·34		
Mint.	4	−34°·75		
Mixture of 4 and 5.		−15°·82	−15°·71	0·3
Mixture of 1, 2, 4, 5.		19°·02	18°·97	0·3

The results of the experiments described in this paper indicate that in making saccharimetric determinations various substances contained in tubes placed end to end yield results which are equal to the sum of the results taken separately, and furthermore, substances physically mixed together preserve their optical rotating properties independently of each other. This last law would enable one to determine the proportions of a mixture, if the amount of one substance and the rotating properties of each were known.

Incidentally it was found that this method could be used in determining the length of a column of liquid with greater accuracy than is afforded by the common methods of measurement. This was illustrated in measuring the lengths of the components of the double tube.

The principal sources of error encountered consisted in errors of observation, which were fairly well eliminated by repeated trials, and temperature changes. The latter were undoubtedly of very little moment.

THE INTERNATIONAL PHARMACEUTICAL CONGRESSES.

By Fr. Hoffmann.

(*Continued from page 325.*)

FOURTH CONGRESS IN ST. PETERSBURG, 1874.

Early in 1874 the committee appointed by the Congress in Vienna addressed a circular letter of invitation and a programme for the fourth International Congress, to be held in St. Petersburg in August, 1874. The invitation was extended to all recognized

pharmaceutical associations and to pharmacists in general, each association being entitled to send one delegate for every one hundred of its members.

The Congress assembled August 12th to 17th. Twelve societies were represented by seventeen delegates from Russia, Austria-Hungary, England, France and Denmark. No delegates were present from Germany and the United States; the English delegation consisted of Mr. Thom. *Greenish* and Francis *Sutton*. Mr. Anton *von Waldheim*, of Austria, was elected President and Messrs. *Madsen*, of Denmark, and *Trapp*, of Russia, Vice-Presidents. The German language was chosen for conducting the deliberations, whilst the use of English and French was also permitted.

Three main questions were proposed for consideration.

(1) How far are assistants personally responsible in the exercise of their professional duties?—Upon this query the resolution passed that the proprietor was responsible for the good quality of all drugs, chemicals and galenicals, and for the proper management and conduct of the business, whilst the properly qualified assistant should be responsible for any mistakes committed by him or his fault and, during the absence of the proprietor, also for mistakes committed by apprentices.

(2) How should the Committee of Inspection of Pharmacies most suitably be composed and appointed?—This query, applying only to the usages in continental Europe, was answered by declaring that the periodical governmental inspection of pharmacies should be conducted by one medical practitioner and one practical pharmacist.

(3) Is it necessary that the professorships of pharmacy should be occupied by pharmacists?—In response to this query the resolution passed, that it is desirable that the professorship of pharmacy should be held by pharmacists and that there should be in the pharmaceutical curriculum two chairs, one for pharmacognosy and one for pharmaceutical chemistry.

(4) Has not the time arrived for the preparation and introduction of an international pharmacopœia?—This question had been answered in the Congress of 1867 by the American delegates in the negative. It again elicited a comprehensive deliberation. In general the necessity of uniformity in all pharmacopœial preparation was recognized. The Society of Pharmacy of Paris presented a

memoir and a draft of an international pharmacopœia. Such a one should not exclude national pharmacopœias, but the former one should serve as a standard in their revision so as to attain in the course of time as much as possible to a uniformity of all or the most commonly used medical preparations, particularely the more potent ones, as also to a uniform nomenclature and the general adoption of metric units and the use of the Latin language for the pharmacopœias.

A committee was appointed for examining the French elaboration and eventually for drafting a new one. The report should subsequently be sent to the Pharmaceutical Society of St. Petersburg before or by December, 1875. This should have the revised draft printed and send copies to the pharmaceutical societies represented at the present congress for revision and approval in time before the next congress.

The following suggestions were recommended to this committee for consideration: The language of the international pharmacopœia should be the Latin, as determined at the preceding congresses at Paris and Vienna. Metric weights and measures should be used where absolute quantities are required; but in pharmaceutical preparations parts by weight or volume might be used. All temperatures should be stated in the centigrade scale, and specific gravities at 15° C. The nomenclature of chemicals should be as simple and definite as possible. The minimum of active principle of narcotic drugs permitted should be stated. Tinctures and other galenicals should be made on one principle with the greatest simplicity, avoiding unnecessary ingredients. In chemical preparations the maximum of impurities allowed should be stated.

At the close of the Congress the invitation from the American Pharmaceutical Association* for holding the fifth Congress in Philadelphia was read, but in no way acted upon. A subsequent preliminary invitation by the British delegates present to hold the meeting in London prevailed, subject, however, to a forthcoming official invitation by the Council of the Pharmaceutical Society of Great Britain.† It was furthermore resolved upon that the fifth

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*Page 324.

† This invitation was unanimously adopted and acted upon by the Council on October 7, 1874 (*Pharm. Jour. and Transactions*, 1875, p. 285).

Congress should convene in the course of the next five years, or at the furthest in 1879.

FIFTH CONGRESS IN LONDON, 1881.

The convocation of the fifth Congress was for various reasons delayed beyond the time appointed in St. Petersburg in 1874. It was not before the end of the year 1880 that the Pharmaceutical Society of Great Britain issued a circular letter of invitation to the pharmaceutical societies as well as to prominent pharmacists, with the request to send delegates and to attend the meetings of the congress to be held in London in August, 1881. As main objects for deliberation there were mentioned the international pharmacopœia, pharmaceutical education, and the relations of pharmacists to the medical profession and the public.

Forty-eight delegates, representing pharmaceutical societies of England, France, Germany, Austria, Russia, Italy, Belgium, Holland, Denmark, Sweden and Australasia, attended the Congress and quite a number of visitors from Great Britain and abroad, among them two from the United States of America (Fr. *Hoffmann* and Oscar *Oldberg*). Dr. Theophilus *Redwood*, of London, was elected President, and not less than sixteen honorary vice-presidents and five honorary secretaries were proposed and elected.

The subject of an International Pharmacopœia was introduced by papers read by Messrs. *J. Dittrich*, of Prague, *J. Martenson*, of St. Petersburg, and *Madsen*, of Copenhagen, each one presenting a number of suggestions and approving the principles recommended by the Congress at St. Petersburg.

In regard to the draft elaborated by the Pharmaceutical Society of Paris and offered to and accepted by the Congress at St. Petersburg, an unavailing controversy as to the final disposition of the manuscript occurred. It was stated that it had been burned in St. Petersburg by an unfortunate mistake or accident, while the French delegates claimed that the original draft was in their possession. The fact is that no available action whatever seems to have been taken with this initial draft for the elaboration of an International Pharmacopœia.

The lengthy discussions about a universal code resulted in the following resolutions unanimously adopted:

(1) The fifth International Pharmaceutical Congress held in London, August, 1881, confirms the resolutions at the previous congresses, as to the utility of an universal pharmacopœia, but is of the opinion that it is necessary at once to appoint a commission, consisting of two delegates from each of the countries represented at this Congress, which shall prepare within the shortest possible time a compilation in which the strength of all potent drugs and their preparations is equalized.

(2) The Executive Committee of this Congress is requested to take the necessary steps that the resolution be speedily carried out.

(3) The work, when ready, shall be handed over by the delegates to their respective governments or their pharmacopœial committees.

(4) It is desirable that the commission establish a uniform systematic Latin nomenclature for the pharmacopœias of all countries.

(5) It is desirable that the commission take measures that an official Latin translation be made of the pharmacopœias of different countries which are not now published in that language.

(6) It is desirable that the commission be put in possession of all the manuscripts, including the documents relating to the Universal Pharmacopœia, compiled by the Society of Pharmacy of Paris and presented at the fourth meeting of the Congress at St. Petersburg.

(7) That the pharmaceutical societies of the respective countries be requested to nominate those members of the commission not appointed by this Congress, and to fill up any vacancies which may arise from time to time.

The next subject of discussion referred to the equalization of the strength of official pharmaceutical preparations containing potent drugs. Mr. *Madsen*, of Copenhagen, presented, in a comprehensive address, a record of previous efforts for attaining to a satisfactory union in this matter, and papers about the subject were read by Messrs. *Peter Squire*, of London, Professor *Schaer*, of Zürich, Dr. *Brunnengraeber*, of Rostock, Professor *Maisch*, of Philadelphia, and others.

The preceding resolutions in regard to the International Pharmacopœia embody the conclusions reached by these writers and the discussions.

The question of pharmacopœial revision was introduced by Mr. *Carteighe*, of London, giving a concise sketch of the condition of pharmacy in England before the foundation and the educational exertions of the Pharmaceutical Society in 1841, as well as of the origination of the British Pharmocopœia in 1864 by the fusion of the pharmacopœias of London, Edinburgh and Dublin, until then in use. The modus of revision prevailing in the various countries was commented upon by Mr. *Peter Squire* and Dr. *Theoph. Redwood*, of England, Dr. *C. Schacht*, of Germany, Dr. *Poehl*, of Russia,

Mr. *von Waldheim*, of Austria, Mr. *Sinimberghi*, of Italy, Dr. *de Vrij*, of Holland, Mr. *Lotze*, of Denmark, Dr. *Gille*, of Belgium, and Professor *Oldberg*, of the United States of America.

The opinions and propositions as to the interval between the successive revisions of the national pharmacopœias were somewhat divergent, five years being considered the minimum and ten years the maximum. The opinion prevailed that a Standing Pharmacopœial Committee was preferable to a temporary one at the time of each revision, and that such committee should consist of a majority of pharmacists.

A discussion on pharmacopœial nomenclature also took place. This question, as well as that of revision, was duly taken in consideration in the final resolutions passed in regard to an international pharmacopœia, stated on page 377.

The question of pharmaceutical education being a permanent feature of pharmaceutical congresses, was again discussed at great length, each speaker reflecting the methods and views prevailing in his country. The general opinion shared by all seemed, however, to be that higher requirements as to preliminary and to professional education, both in apprenticeship and university or college instruction, are requisite, and that the curriculum of the branches of instruction should be enlarged in compliance with the recent extensions in the domains of chemical, pharmacognostical and microscopic knowledge and application. An approximate uniformity in the methods and the scope of professional education was also recommended as desirable.

A motion by Mr. *Petit*, of Paris, "that it is desirable in all countries that the curriculum of professional education of the pharmacist should be made uniform with that of the grade of doctor of medicine," was laid upon the table, and, in conclusion, the whole question was left an open one to be considered by subsequent congresses.

The last question discussed was on the relations of pharmacists to the medical profession and the public. This intricate subject of long standing evidently met with little interest, as its bearing is a very different one in the various countries, and no special action was taken.

In conclusion, the place for holding the next Congress was taken into consideration. Only one invitation had been received, namely,

from the *American Pharmaceutical Association.* The officers of the Congress, however, had come to the conclusion that a more accessible country would be preferable, and the city of Brussels was selected for holding the next Congress in 1884.

SIXTH CONGRESS IN BRUSSELS, 1885.

The sixth International Pharmaceutical Congress should have been called to Brussels in 1884, but on account of a general industrial exposition taking place in Antwerp in 1885, it was postponed to this year. The local committee at Brussels had succeeded in securing the interest of the highest authorities of the State in the Congress, so that it was for the first time in the history of pharmaceutical congresses favored with royal patronage, and by the participation of high State officers. This fact was a novel one, as well as the latitude in the programme issued with letters of invitation by the local committee early in 1885. This proposed, among other things, the consideration of the following questions: On theoretical and applied pharmacy; on hygiene and public health; on biological and legal chemistry; on the international pharmacopœia elaborated and to be presented by the commission appointed at the Congress in London, in 1881; on pharmaceutical education; on sophistication of alimentary substances, and, finally, on potable waters, their requisite quality, and the best methods for their examination.

Other innovations of this Congress were that it invited delegates from governments, universities, schools of pharmacy and from pharmaceutical, chemical and hygienic associations, and all those interested in the subjects pertaining to pharmacy in its broadest scope, who desire to attend the meeting and pay a fee of 10 francs ($2) for admittance. Another novel feature was that all questions brought for discussion before the Congress should first be considered and reported by sections.

The Congress convened at its first meeting in Brussels, August 31, 1885. It was opened, on behalf of the King of Belgium, by his representative, the Minister of Foreign Affairs, Prince *Caraman-Chimay.* It was of all the preceding pharmaceutical congresses the most frequented one, consisting of approximately 300 delegates and visitors, representing twenty-three countries and seventy-two societies, whilst at the meetings in Vienna only eight countries, at

St. Petersburg five countries, and at London eighteen countries were represented. The United States were, as in London, not represented by a delegate, while Mr. *Fred. Stearns, Sr.*, of Detroit, attended as a visitor.

Mr. *Van Bastelaer*, of Brussels, was elected President, and quite a number of honorary vice-presidents and sectional presidents. As much as this Congress differed from the preceding ones in its organization, sections and the admittance to membership, it deviated also in the nature and variety of questions proposed and introduced in its deliberations. Besides the inveterate questions of an international pharmacopœia, equalization of the strength of pharmacopœial preparations, pharmaceutical education and examination, the relation of pharmacists to physicians, and nostrums and specialties, such questions as veterinary pharmacy, the regulation of the supply of patent medicines, the repetition of prescriptions containing poisonous alkaloids, the sale of morphia and opiates, the relative advantage of self-made chemicals and galenicals over purchased ones, the danger of lead pipes for water supply, of poisonous pigments, of the adulteration of food, the freedom of movement of assistants, etc., were introduced and more or less discussed, and resolutions passed thereon. Of these only those questions may be briefly mentioned here, which strictly apply to the practice of pharmacy.

The question of pharmaceutical education was, as at the previous congresses, fully ventilated with the same variety of diverging opinions, according to the usages and the conditions prevailing in each country. The delegates from Belgium submitted the following propositions:

(1) That in all countries where it is not already the case, a diploma should be established, giving the exclusive privilege to practise pharmacy.

(2) To require candidates for pharmaceutical qualifications to pass through the same preparatory course of study as medical men and doctors of science.

(3) That the minimum of knowledge to be required of the pharmacist should be defined.

(4) The various titles now in use should be replaced by that of "doctor of pharmacy."

(5) To obtain as a subsidiary object, limitation of the number of pharmacies proportional to the population.

These motions were controverted, particularly by German, Austian and Russian delegates, as also the proposition to continue, as in France, or introduce two grades of pharmacists, one for those

who serve the practical and mercantile side of pharmacy, and one for those who aim higher and desire to devote themselves to the scientific objects and aims of the modern application of pharmaceutical knowledge and practice. Other delegates argued that it would not do to aim too high in the extent of erudition and too far in the practical domain of the pharmacist, as also that the professional and social standing of the pharmacist could not be raised by mere titles and diplomas, but only by personal qualification and character. Academic degrees should not be degraded for the sake of professional vanity and convenience. It would be better and proper, as Messrs. *von Waldheim* and *Genevoix* stated, to be conservative and not to enter upon extravagant experiments in regard to the consonant position and requisite attainments of the practising pharmacist. Professor *Cannizzaro* stated that in Italy the government had been compelled to recede from its too high requirements at the pharmaceutical examinations, because young men refrained from entering under such conditions a profession with so limited chances.

Mr. A. *von Waldheim*, President of the commission for the elaboration of a draft of an international pharmacopœia, appointed by the Congress in London in 1881, had performed this duty and submitted his elaboration to the Congress. The paper contained a historical introduction; 232 drugs and preparations had originally been proposed to be incorporated into the pharmacopœia; of these, 188 were approved by the commission, but further propositions from various countries carried this number up to nearly five hundred articles. Upon further consideration and voting, 293 articles were accepted and adopted in the draft; of these, 188 were considered as indispensable in a pharmacopœia, whilst 112 were of less consequence. In the draft the former ones were printed in larger, the latter ones in smaller type, and on the margin it was stated in what national pharmacopœias they are contained.

This draft and its principles met with so general appreciation and approval, that the French delegates retracted their draft presented to the Congress in St. Petersburg, in 1874.

It was resolved to have the draft of Mr. *Waldheim* distributed for consideration and further suggestions and to have it subsequently printed and published.

The question of the limitation of pharmacies in proper proportion to the number of inhabitants, was discussed by the delegates of the

continental countries. Mr. *Bratimos*, of Athens, advocated strict limitation; his views were supported by others; Professor *Godefroy*, of Vienna, described the legal regulations in Austria, Mr. *Krohn*, those of Norway, and Mr. *Bernaco*, those of Italy. Delegates from Holland thought it sufficient to exact limitation only by stricter requirements in the professional qualification of the pharmacist.

The resolution was finally passed that the Congress approve of the principle that the public interest of every country requires a limitation in the number of pharmacies, and that this Congress elect a committee to report to the next Congress on the condition of the pharmacists in the various countries and to collect statistical and other evidence of the advantages derived from the limitation of the number of pharmacies.

A voluble and acrimonious discussion was brought about by the question of nostrums and specialties. Professor *Zanni*, of Constantinople, moved that this Congress appoint an international commission, charging it with the examination of the prevailing nostrums and specialties of the market and to discriminate between those which may be admitted and those which should be prohibited. Belgian and other delegates depreciated the nostrum trade, while a number of Parisian pharmacists pleaded in favor of specialties and proprietaries. They called attention to the great economic importance of this ever increasing industry, the export of such remedies from France alone amounting to, approximately, 14,000,000 of francs *per annum*. They also controverted the assumption that this industry was based indiscriminately upon barter and gain without any scientific and therapeutical principles and merits. Such remedies were justified and sanctioned by their undeniable success and popular confidence and approval and were largely of recognized value and advantage to both the poor and the wealthy.

Notwithstanding this warm endorsement, the following resolution was passed with a considerable majority: "The Sixth International Pharmaceutical Congress deems it desirable in the public interest that nostrums and pharmaceutical proprietaries be strictly prohibited in all countries."

Attention was called by Mr. *Limousin*, of Paris, to the fact that twenty years ago a similar resolution had been passed by the Congress at Brunswick without any appreciable success or effect. The

industry of specialties had wonderfully progressed and prospered ever since.

The question of the dispensation of potent and poisonous substances in prescriptions and the indiscriminate repetition of these was fully taken in consideration, as well as the sale of morphia and opiates, and it was agreed that a strict regulation is imperative, but is mainly in the function of medical and sanitary authorities and the special legislation of each country.

Papers were read and a lengthy discussion took place on the questions of adulteration of food and the quality and purity of potable waters, and comprehensive resolutions were passed for instituting national and international regulations for their control and examination as well as for adopting standards defining the requirements to be made upon water to be considered of normal and healthy condition.

The question of the freedom of movement (Freizügigkeit) of pharmaceutical assistants and some other questions of the lengthy programme, more or less irrelevant to pharmacy of non-European countries, were briefly discussed without any definite result, or altogether dropped.

At the final close of the meetings it was resolved that the seventh Congress shall be held at Milan in 1888.

(*To be continued.*)

THE STORY OF THE PAPAW.

By F. B. Kilmer.

(*Concluded from p. 348.*)

GLUCOSIDE OF THE PAPAW.

The *Carica Papaya* contains a glucosidal body, caricin. This I have never been able to obtain except from the seed, in which it is fairly abundant. From this source it may be extracted after boiling the seeds with 75 per cent. alcohol. The residue after alcoholic extraction is then exhausted with water. The aqueous extract after the addition of barium carbonate is evaporated to the consistency of a soft extract from which the glucoside may be extracted with hot alcohol. From such a solution the glucoside separates upon concentration. This glucoside resembles sinigrin.

It is decomposed by the glucoside splitting ferment, myrosin (obtained from mustard), giving a volatile, odorous, pungent flavor suggestive of the Cruciferae, but not so marked.

The seeds of papaw also contain the glucoside splitting ferment, myrosin. The glucoside resides within the hard inner coating of the seed, while the myrosin ferment is secreted in the gelatinous outer envelope. Myrosin may be extracted from this mucilaginous substance with water and precipitated from the watery solution by alcohol.

By pursuing the methods here briefly outlined, we may separate the glucoside from the inner section of the seed and the ferment from the outer coating; and by bringing the two substances together in the presence of water, the glucoside will be decomposed with the production of a volatile essence and glucose.[18]

The myrosin ferment extracted from the mucilaginous coating of the papaw seed will decompose sinigrin. The action of this ferment and decomposition of the glucoside is apparent to the sense of taste when the seeds are chewed. The taste and odor indicate that the glucoside and ferment are present in the bark of the root.

ALKALOID.

An alkaloid—carpaine—has been separated from the *Carica Papaya*. The source so far noted has been the leaves.

The usual method of extraction is to digest the leaves in alcohol acidulated with hydrochloric acid (5–100); evaporate the extract, wash with water acidulated with hydrochloric acid (2–100). This solution is then washed with ether; made alkaline with sodium hydrate and the alkaloid washed out in chloroform or ether. In my experiments the yield was small. I have noted indications of alkaloidal reaction with Mayer's reagent in the alkaline ether washings, from the latex, but it cannot be stated that the alkaloid is present in this product.

The alkaloid, carpaine, is soluble in absolute alcohol, amylic alcohol, chloroform, benzine and in water acidulated with hydrochloric acid.

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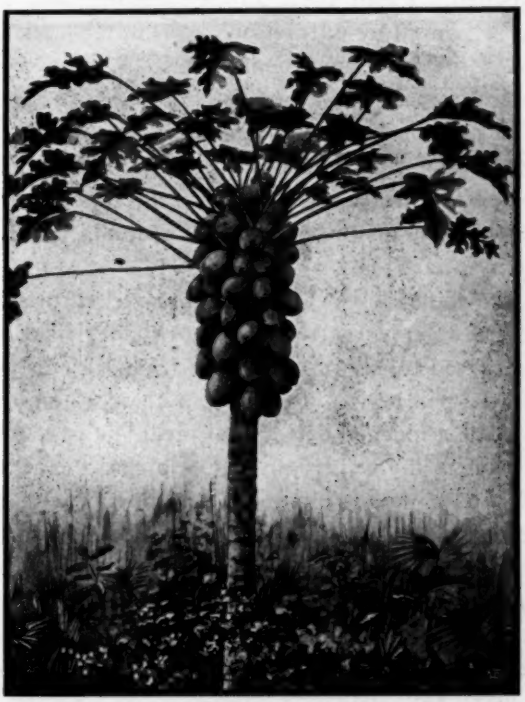
[18] It has been demonstrated that in many instances the ferment and the glucoside upon which the ferment acts are enclosed in different cells in plant tissue.

A solution of carpaine reacts with indicators as follows:—red litmus paper is turned blue; hæmatoxylin, deep rose or wine; rosolic acid, deep rose; cochineal, deep rose; methyl-orange, yellow; lacmoid, no change. Phenolphtalein causes a turbidity with the usual red, but the reaction is obscure in the presence of alcohol.

The physiological action of this alkaloid is quite similar to that of digitalis, a heart depressant.



Carica Papaya cultivated.

MARKET PREPARATIONS OF THE PAPAW.

There are numerous preparations in our own and in the European markets claiming to be the ferment of the papaw. These are sold under the name of "papain," "papayotin," "caroid," "papoid," etc.

From a somewhat extended examination I am quite satisfied that several of the preparations named are the dried and powdered papaw milk. In this case they bear the same relation to the true separated ferment as the dried mucous membrane of the stomach

might bear to purified pepsin. Some of these so-called papaíns retain the waxy, rubber-like constituents and the acrid, irritating resins of the milk.

The application to such crude material of the term "papain," or any similar name which would imply the isolated ferment, is misleading and should be abandoned. Tne dried juice of the papaw, or a mixture of the dried juice with any other ferments, should be properly labelled. From these crude preparations, the true ferment can be separated by extraction with water and precipitation with alcohol. In a few experiments which I have tried, some of the crude preparations were found to contain about twenty per cent. of the ferment-bearing bodies (albuminous).

There are, however, preparations in the market which consist of the more or less purified and separated ferment, or, more accurately speaking, consisting of the separated proteids; with which the ferments are associated.

I know of no standard by which these market preparations can be judged. They vary greatly in their proteolytic action. In such as may be prepared by simple drying of the milk, no two lots can be alike. These will be found to vary in color, to emit an offensive odor and to have a marked acrid disagreeable taste, producing, in several instances in my experience, quite a sharp caustic action.

The dried papaw juice is usually the more energetic in the beginning of digestive action than is the purified ferment, but this energetic action of the dried juice apparently soon ceases, while the pure ferment, though slower in immediate action, continues its activity for many hours. Upon treating the preparations made of the dried juice with ether, chloroform, benzine or alcohol, evaporating the solvent, the waxy resinous and rubber-like residue elsewhere spoken of will remain.

The amount of residue left after extraction with water may be taken as a rough estimate of the foreign material present, the ferment itself being associated with a more or less soluble albumose. A more accurate method of estimation as to the amount of ferment-bearing bodies is as follows:—Extract a weighed portion of the powder with water (two or three successive portions with trituration); combine the aqueous solutions and saturate with crystals of magnesium sulphate and sodium sulphate in about equal proportions. If the solution is warmed the precipitate will be quicker.

The precipitate thus obtained, freed from salts by dialysis, will consist of albumose and globulin, and the weight of these when dried will give the measure of soluble bodies with which the ferment is associated, or the amount of ferment-bearing bodies in the sample.

In the best of the market preparations which I have examined I have found, in addition to these soluble bodies, insoluble globulins and an appreciable amount of peptone, the latter not being precipitated by the foregoing methods.

Carica Papaya, split open to show sections in centre of trunk.

DIGESTIVE ACTION.

The digestive action of the ferment of the papaw plant has been quite fully described. The actions which are here summarized have been made with one of the market ferments sold under the name of "Papoid."[19]

[19] This preparation was used on account of its convenience and because of the lack of sufficient material, separated by the processes outlined in another part of this paper.

Papoid is a German production, and, according to the statement of the manufacturers, it is prepared by precipitation from a watery extract of the papaw juice or milk. It consists essentially of globulin and albumose, associated with the ferments, and in addition it contains a small amount of natural inorganic salts. This preparation was used by the writer in a previous communication, and by Chittenden, (See "Papoid Digestion" Transactions of Connecticut Academy, Vol. IX, 1892.)

The action of this ferment presents features which contrast peculiarly with those of the ordinary digestive ferments. Direct comparison of the enzyme of the papaw with any other ferment is practically impossible, and this is especially true as to its behavior in comparison with the animal ferments.

The action of most ferments is inhibited by the products of digestive action; such does not seem to be the effect in the case of the papaw enzyme. It acts in a concentrated solution, even when carrying products of its own action. Certain of my experiments tend to show, however, that this enzyme has a notable action in a stream of running water. In other words, its action seems to be continuous, and the ferment is not removed by washing or by the action of fluids in which it is soluble. One such experiment was as follows:

Two ounces of raw lean beef were cut into slices, over which was poured an alkaline solution of the papaw ferments. The beef was allowed to remain in this solution for half an hour, during which time the solution was fairly well absorbed and the beef somewhat softened. The whole was then wrapped in a filter paper, transferred to a fine muslin bag; this bag and contents were placed under a faucet of running water and allowed to remain for five hours. Upon opening the bag it was found that only a few shreds of meat remained.

In order to demonstrate that the action was not that of a washing away process due to force of the water, a check experiment was made without the ferment, here the loss in weight only amounted to about fifty per cent.

This experiment seems to show that the enzyme combined with and hydrated the fibres of the meat. The products of this combination are soluble, and are removed by the action of water or other fluids; furthermore, in the process of washing away the soluble

products, the ferment is left behind to act upon a fresh portion of the fibre, in turn giving rise to soluble products or peptones.

This experiment was made in order to imitate certain known conditions present in the process of digestion, where there is a constant stream of fluid in the intestinal tract. Taken with other experiments this result seems to show that ferments of the papaw act very energetically in a small amount of fluid, and will also act in a stream of water.

Wild Papaw.

The influence of reaction upon the ferments of the papaw form an interesting comparion with those of the animal ferments.

The power of pepsin is destroyed in alkaline solution, such as lime water, sodium bicarbonate, ammonia, etc.; on the other hand the activity of pancreatin, ptyalin or diastase is inhibited in acid solution. The papaw enzyme is active in acid, neutral or alkaline solution; but pepsin and pancreatin cannot be mixed together in solution either acid, alkaline or neutral, and still preserve their

characteristics; whereas, the ferments of the papaw can be mixed with other ferments in a solution of any reaction. Pepsin is inert in a neutral solution, and is destroyed in solutions containing traces of alkalinity. If an alkaline solution of pepsin be made acid, the pepsin action is not restored; pancreatin acts slowly in neutral solutions, and is destroyed in acid solution. If an acid solution of pancreatin be made alkaline, the pancreatin action will not be restored. The papaw ferments are active in neutral solutions; their activity is enhanced when such solution is made acid, and if such acid solution be in turn made alkaline, the ferment will still remain active. In fact, the changing of solution of the papaw ferments from acid to neutral, then to alkaline; then reversing the order to neutral, acid and alkaline, or, in fact, changing the order of reaction almost indefinitely, does not thereby destroy the ferment which seems to remain active under all reactions and conditions.

Certain physical changes in the proteid substances acted upon are characteristic of these enzymes of the papaw. For instance: when raw blood fibrin or raw beef is acted upon with an alkaline solution of these ferments, there is an immediate softening to a jelly-like mass in which the fibres lose their individuality, this jelly gradually becoming thinner under the further action of the ferment.[20]

In the case of cooked beef in either alkaline or acid solution, the action of the ferment of the papaw is quite different. There is a rapid disintegration of the fibres which separate into tiny fragments. Finally the undigested portion becomes a pultaceous residue.[21]

A most interesting feature of the papaw enzyme is its action at a wide range of temperature. With the animal ferments, especially pepsin and trypsin, digestion is very slow at room temperature, 68 to 70 F. While at this temperature the papaw enzyme acts as energetically as at 110 F., the animal ferments act most energetically at body temperature (diastase at 130 F.)

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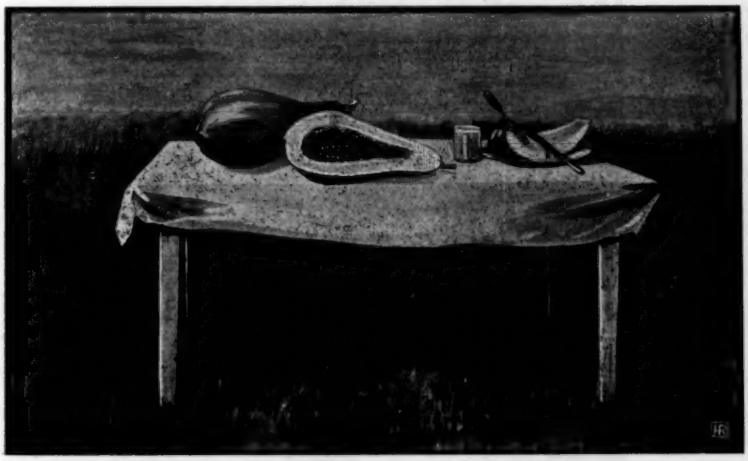
[20] This action in the case of blood fibrin is quite striking, and advantage is taken of this property in therapeutics where a solution of the ferments is used as a solvent for the false membrane of diphtheria, a substance quite analogous to blood fibrin.

[21] It is notable that with meat proteids, both cooked and uncooked, in acid or alkaline solutions containing no ferment, there is a marked swelling of the fibre. In an alkaline solution this becomes a solid jelly, but this swelling seems to be entirely counteracted by the presence of the papaw ferment.

With the animal ferments, if the temperature be raised to near 140 F., there is a diminution in the digestive action, and at about 158 F., pancreatin is destroyed; pepsin at about 160 F. Quite the reverse is the influence upon the papaw ferments. Here the action, beginning as low as 50 or 60 F., increases slightly with the rise of temperature until between 155–160 F. it reaches the maximum. The action is not entirely destroyed even at a few moments' exposure at the boiling point. A digestive ferment active at temperatures ranging from 50 F. to the boiling point is notable.



Papaw fruit as a tropical dessert.

PRODUCTS OF DIGESTION BY THE PAPAW FERMENT.

A peculiar phenomenon arises in the digestion of albumen by the papaw enzyme. It is particularly noticeable in the digestion of egg albumen in alkaline solution, but it is manifest in the digestion of raw flesh albumen in either acid, neutral or alkaline media. After every prolonged digestion there is found an undissolved residue, which many observers have characterized as an unchanged albumen, and which is usually measured as undigested residue. But such is not the case. This residue is an altered albumen; is soluble in 0·3 to 0·5 per cent. solution of sodium carbonate or 0·2 per cent. hydrochloric acid. From such solution it is reprecipitated upon neutralization, and re-dissolved by an excess of the precipitant. It is insoluble in salt solutions. Its solution in sodium carbonate upon dialysis becomes almost entirely soluble in water.

The dialyzed solution noted above gives a precipitate with acetic acid and potassium ferrocyanide, but nitric acid gives no precipitate. The solution gives the ordinary proteid reactions, and apparently the whole of the proteids are reprecipitated by the addition of a large quantity of alcohol. This body is further digested after washing and treatment with a fresh solution of the ferment, and also in an acid solution of pepsin; it is almost completely digested in an alkaline solution of trypsin, yielding (as shown at one trial) the ordinary

Method of collecting Papaw latex.

products of digestion. This body corresponds quite closely to the antialbumid found in digestions by hydrochloric acid and by trypsin.[22]

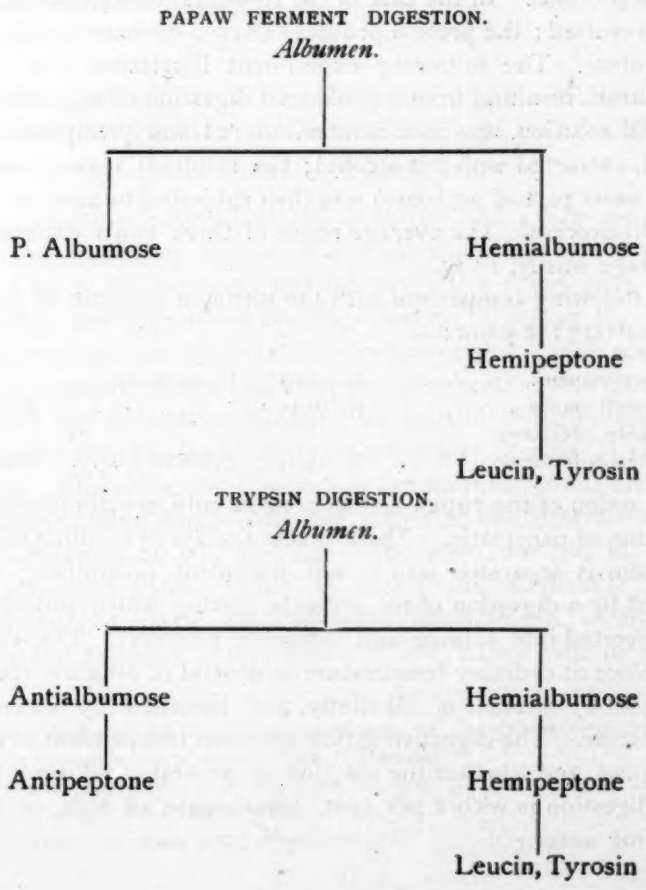
The products arising in the digestion of egg albumen, blood fibrin or beef albumen are quite alike either in acid, alkaline or neu-

[22] A quite similar body is found in Brometin digestion of albumen. (See Chittenden—*Journal of Physiology*, No. 4, 1893.) It is quite evident that this body would be readily converted into soluble absorbable products in the digestive tract.

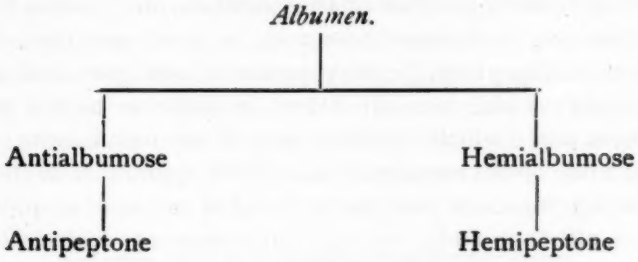
tral solutions, with the exception of certain slight modifications dependent upon the conditions of trial, reaction, etc. Hemialbumose (protoalbumose, deuteroalbumose and, in some instances, heteroalbumose), hemipeptone, peptone products, and the amid bodies, leucin and tyrosin, are all found in addition to the peculiar body above noted which is present only in minute amounts.

All of these bodies seemingly make their appearance in the early stages of digestion, and each one is found at the end of prolonged digestion, although under ordinary circumstances deuteroalbumose and true peptone predominate to a high degree.

The close identity of the products of the action of the enzyme of the papaw and that of tryptic and pepsin digestion can be seen in the accompanying diagram:



PEPSIN DIGESTION.



NITROGEN IN DIGESTIVE PRODUCTS.

It is well known that the hemialbumoses and peptones formed by pepsin or trypsin show an increase of nitrogen above that of the original proteids. In the case of the ferments under consideration this is reversed; the proteid products show a decrease in the nitrogen content. The following experiment illustrates this: The clear filtrate resulting from a prolonged digestion of egg albumin in a neutral solution, was concentrated, filtered and precipitated with alcohol, extracted with hot alcohol; the resultant mass (consisting for the most part of peptones) was then subjected to analysis by the Kjeldahl process. The average result of three trials expressed in percentage was N, 14·14.

The following comparison with the nitrogen content of proteids will illustrate the point:—

Egg albumen	N. 16.02	Hamerstein . . . . .
Hemialbumose	N. 16.55	. . . . . Kuhne
Soluble proteoses (papaw ferments)	N. 14.14	(3 trials) . . . . . Kilmer

The action of the papaw ferments upon milk is quite identical to the action of pancreatin. There is first the act of curdling in which the casein is separated into a soft flocculent precipitate; this is followed by a digestion of the proteids, during which process they are converted into soluble and diffusible products. The curdling takes place at ordinary temperature in neutral or alkaline reaction; is delayed by increase of alkalinity, and hastened by increase of temperature. The digestive action proceeds independent of the act of curdling, and whether the reaction is neutral, acid or alkaline. (Best digestion is with 2 per cent. bicarbonate of soda or 25 per cent. lime water.)

In addition to the proteolytic and rennet ferments noted, and the probable presence of pectase, there is present in the papaw latex, amylolytic ferment capable of acting upon cooked starch. The amount of this starch-converting ferment is not large, or else it is weak. The fresh latex acts promptly upon starch paste, thinning it, and converting a portion at least into soluble starch and dextrin. (The amount of reducing sugar produced is slight.)

The starch-converting action of the separated ferment (or dried latex) is not very pronounced. The most that can be said is that it is present.[23]

Altogether we are warranted in the statement, that the digestive action of the ferments contained in the papaw latex and the products formed in such are quite identical with that of the animal and vegetable ferments in general.

A RAPID METHOD FOR DETERMINING THE VALUE OF "CHROMIC ACID" AND THE SOLUBLE CHROMATES.

By Lyman F. Kebler, B.S.

The principle involved in the beautiful and exact method for estimating iodine by means of sodium thiosulphate was brought forward by A. du Pasquier,[1] but the original method gave neither satisfactory nor concordant results. Bunsen[2] took up the process and pointed out the cause of its shortcomings. These researches on the volumetric estimation of iodine, in connection with Schwarz's[3] proposed use of sodium thiosulphate instead of sulphurous acid, produced a very beneficial effect on the whole domain of chemical analysis. The value of the process is not so much in the estimation of iodine in iodine compounds, but rather in the determination of such substances as will liberate iodine when brought in contact with potassium iodide, either by direct displacement (*e. g.*, the chlorinated compounds, chlorine water, bromine, etc.) or by reduction in the presence of hydrochloric acid, either with or without

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[23] The pronounced amylolytic action of some of the papaw ferments in the market is probably due to the addition of diastase.

[1] 1840, *Anal. de Chimie et de Physique*, 73, 310; *Silliman's Jour.*, 40, 123.

[2] 1853, (Liebig) *Anal.*, 86, 265–291.

[3] 1853, *Anleit. zu Maassanal. Nachträge*, 22.

heat (*e. g.*, CrO_3, PbO_2, MnO_2, As_2O_5, $FeCl_3$, etc.). The details of the various methods must be worked out for each substance to be estimated. If a chromate is boiled with an excess of strong hydrochloric acid, chlorine is liberated, which can be distilled and conducted into a solution of potassium iodide, contained in a suitable apparatus. The distillation may be avoided by mixing the chromate, a saturated solution of potassium iodide and the hydrochloric acid in a strong bottle, provided with an accurately ground stopple. The stopple is firmly tied in, the bottle with its contents immersed in water and the temperature raised to boiling, where it is kept for one hour. The bottle is then removed, cooled and the amount of liberated iodine estimated by means of N/10 sodium thiosulphate.

Both of the above methods are more or less tedious and are liable to give abnormally high results, on account of the proneness of the hydriodic acid formed to decompose. A blank should always be carried.

The writer has used the following method with considerable satisfaction: Dissolve about 1 gramme (accurately weighed) in enough distilled water to make exactly 100 c.c. Of this solution transfer 20 c.c. into a porcelain evaporating dish containing 75 c.c. of water, add 2 grammes of potassium iodide, 15 c.c. of 10 per cent. sulphuric acid and mix well. Then add, from a burette, N/10 sodium thiosulphate until a distinct blue color, without yellowish cast, results, or the end may be determined by means of a starch solution.

It was at first thought that some time must be allowed for complete reaction of the above mixture, before the liberated iodine can be estimated, but the writer soon found that the reactions were almost instantaneous.

The reactions involved are represented by the following equations:

(1) $2\,Cr\,O_3 + 6\,KI + 6\,H_2SO_4 = 3\,I_2 + Cr_2(SO_4)_3 + 3\,K_2SO_4 + 6\,H_2O$.

(2) $3\,I_2\,6\,Na_2S_2O_3 = 3\,Na_2S_4O_6 + 6\,NaI$.

(3) $K_2Cr_2O_7 + 6\,KI + 7\,H_2SO_4 = 3\,I_2 + 4\,K_2SO_4 + Cr_2(SO_4)_3 + 7\,H_2O$.

(4) $3\,I_2 + 6\,Na_2S_2O_3 = 3\,Na_2S_4O_6 + 6\,NaI$.

According to equations (1) and (2), one equivalent of CrO_3 requires three equivalents of $Na_2S_2O_3$, or the decinormal factor of CrO_3 is one-third of 0.009988 or 0.003329. In the same way the

decinormal factor of potassium bichromate is one-sixth of 0·029378 or 0·004896.

An examination of several samples of "chromic acid" gave the following results:

Number.	Color of Crystals.	Sulphates.	Per Cent. of CrO_3.	Aqueous Solution.
1	Brownish red	Much	66·66	Clear
2	Dark crimson	None	93·71	"
3	Light brick red	60·53 per cent. calculated as $NaHSO_4$, H_2O	38·28	"
4	" " "	59·76 per cent. calculated as $NaHSO_4$, H_2O	38·89	"
5	Crimson	4·2 per cent. calculated as H_2SO_4	93·83	"

There certainly is a marked difference in the physical appearance of the above samples. No. 2 was of satisfactory quality. No. 5 was a beautiful crystalline product and the writer was very much surprised to get a reaction for sulphates. It also gave evidence of containing a sodium salt. Nos. 3 and 4 were fairly good physically. According to the above analysis they consisted of nothing but a mixture of chromic acid and sodium acid sulphate, obtained by mixing the proper proportions of sulphuric acid and sodium bichromate; $Na_2Cr_2O_7$, $2\ H_2O + 2\ H_2SO_4 = 2\ CrO_3 + 2\ NaHSO_4 + 3\ H_2O$; then evaporating the mixture to dryness. These samples may have been intended for technical purposes, but no such information could be found anywhere on the container. It appears to be the custom of some manufacturers, however, to deliver some of their goods without the semblance of a label as to contents or quality; which appears to the writer to be a very dangerous practice.

The above method has also been applied to the soluble chromates with satisfactory results.

LABORATORY OF SMITH, KLINE & FRENCH CO.

DR. CHARLES MOHR, the well-known botanist, died July 17, at Asheville, N. C. He was to be classed with the school of botanists who contributed so much to the development of American Botany.

DR. HENRY C. C. MAISCH, eldest son of the late Professor John M. Maisch, died July 1st, in Philadelphia. In recent years he had devoted himself to pharmaceutical chemistry and analytical work.

CORRESPONDENCE.

Procter Memorial.

In response to a letter from the editor of this JOURNAL concerning the feasibility of establishing a Research Laboratory as a memorial to the life and work of Prof. William Procter, Jr., by the American Pharmaceutical Association at its semi-centennial in 1902, the following are some of the replies which have been received:

DEAR SIR:—If sufficient money can be obtained from the pharmacists of America to establish a properly equipped Research Laboratory in Philadelphia, or elsewhere, it seems to me as if no more fitting memorial could be started. Without doubt it is more in accordance with the scientific spirit of the age than anything else yet proposed. In every respect it is ideal in that it alone stands forth as at once a blessing to the future and the payment of our obligation to the past for the heritage of good things it has accumulated for us.

Let us then, if possible, standing as we do in the very centre of the first century of the American Pharmaceutical Association, project into the second half of that century work that will show that we had our hearts in the right place and sought in deeds more than words to prove it. Such a laboratory could do far more for the good of future pharmacists and for the future of the Association than the same amount of money spent in any other direction conceivable. Like a well of pure water it would ever flow on, making the uncultivated and at present desert regions of pharmacy blossom as the rose. A single important discovery made therein might bring, in hard cash, to the pharmacists of the world all that the project would cost and multiply that amount many fold. Other proposals, hitherto made, can only give pleasure to a few. This proposal covers the good of the whole race for all time to come and if carried out will multiply blessings far beyond anything foreseeable. By all means let us try and establish a Research Laboratory, thus proving that we are really alive to the spirit of the

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[1] For other information and correspondence on this subject, see this JOURNAL, November, 1900, and February, March, April, May, June and July, 1901.

twentieth century and not sessile, non-progressive imitators of the methods of the nineteenth and earlier centuries.

BROOKLYN, N. Y. R. G. ECCLES.

DEAR SIR:—Responding to your letter of the 5th inst. relative to the establishment of a research laboratory, in our opinion there is but little room for discussion of the additional proposition or that something of the kind will be an accomplished fact in the near future. Regarding the management, scope and modus operandi of such a laboratory, these will furnish ground for considerable discussion and we are not prepared to express ourselves at the moment. In view of the importance of individual research work that would be connected with the better equipped manufacturing laboratories of the country, the work of such a laboratory as you suggest would naturally follow more general lines and should, we think, have special reference to the needs of the U. S. Pharmacopœia. In the writer's opinion there is room for vast improvement and additions to this valuable work, and he would be glad to see a movement inaugurated that would tend to bring our National Formulary up to the standard of the times. Outside of this, there is a large field in connection with the development of scientific pharmacy as opposed to the commercialism which unfortunately is such a feature of the day. THE WM. S. MERRELL CHEMICAL COMPANY.

CINCINNATI, O.

DEAR SIR:—We acknowledge your favor of April 5th and beg to state that we certainly approve of the idea mentioned, but we hardly know how we can enter into any detailed discussion or expression of opinion other than to endorse the project of a research laboratory.

We are in favor of the undertaking, and we remain,

NEW YORK CITY. LEHN & FINK.

DEAR SIR:—Referring to your favor of April 5th would say, that in reference to the establishment of a research laboratory, that we do not care to express ourselves for publication upon this project, except that you are at liberty to use our name as favorable to the scheme. Pressure of other matters prevents our taking part in the discussion at the present time, although we may do so at a later date. JOHNSON & JOHNSON.

NEW BRUNSWICK, N. J. F. B. KILMER.

DEAR SIR:—Your typewritten letter of February 9th forwarded here where I am wintering.

I, of course, knew Mr. Procter intimately and well, and thought very highly of him. I do not get the JOURNAL, as I am many years retired from any active part in my company, and now an aged man waiting my time to pass over to the great majority.

Mr. Procter was an exceedingly modest man, and I feel as if his best wish in regard to a memorial would be in establishing a scholarship or to secure a medal to the person (student) who did the best work each year in some scientific institution in the line of study he enjoyed most.

Thanking you for your letter, and wishing you success, I am

Very truly,

CAIRO, EGYPT. FREDERICK STEARNS.

DEAR SIR:—I do not know enough about the history of research laboratories to give you an opinion worth anything, regarding the probability of the success of such a project in this country.

Most of the discoveries in science are the result of work to an objective point which is necessary either to the routine or success of some purpose, and if a research laboratory were established by the American Pharmaceutical Association, or by other joint ownership, where skilled and confidential research could be had for a fair consideration, I believe it would be measurably successful, but it seems to me that it would be difficult to raise a large fund for a laboratory in which the interest would be purely scientific and unselfish, and the ends indefinite. HORATIO N. FRASER.

NEW YORK CITY.

DEAR SIR:—I am not exactly sure that I fully understand the purport of your proposition upon which to base an intelligent opinion.

The first essential to success in the establishment of a "Research Laboratory," whether by itself or in connection with some pharmaceutical school, is an ample endowment, a definite revenue, sufficient to attract and compensate the best talent. Upon this basis there would be hope of progress and permanence, for decadence sets in as soon as progress ceases. This principle applies to institutions as well as to individuals.

Again, the field of pharmaceutical research is already somewhat

occupied by the more or less complete equipment of our large pharmaceutical manufacturing establishments, whose incentive is not alone influenced by a sentimental love of science, but rather by the hope of the material rewards following in the wake of successful discoveries.

Human observation and experience teaches that the most enthusiastic advocates of the ideal and abstract are the most tardy in handing out their cash in the realization of the positive and concrete.

As an ample endowment, then, must be the *sine qua non* to the establishment of a research laboratory to commemorate the fiftieth anniversary of the American Pharmaceutical Association, the contribution to that end must be the measure of the sentiment in its favor. JOHN F. PATTON.

YORK, PA.

DEAR SIR:—I should heartily favor the establishment of a Procter Research Laboratory provided some benign pharmaceutical Crœsus could be found to furnish the necessary building fund and an endowment of $250,000 or more. Possibly John D. Rockefeller or your own John Wanamaker can be made to see the desirability of adding a sister institution to the proposed medical research laboratory about to be started by the Standard Oil magnate. At present I feel confident that our wish cannot be realized and some more modest memorial must be selected. I should favor, first, a gold memorial medal like the Hanbury testimonial, to be awarded every two or three years; second a scholarship to be awarded every two or four years. The first is more likely to be realized as it will cost less money and is more likely to be within the grasp of the A.Ph.A. The second would require a much larger fund to be raised by outside subscription. CHAS. CASPARI, JR.

DEAR SIR:—Your request for an expression of opinion with regard to the various suggestions for a suitable memorial for Prof. Wm. Procter has received careful consideration.

(1) The proposition to establish a research laboratory at Washington is not, in my opinion, feasible; not that the money could not be raised to establish the laboratory, but the difficulty would be to *carry it on successfully for a term of years.* It would be far better not to attempt such an ambitious scheme, if it were not

reasonably certain that it could be maintained successfully and creditably for a long time. To start such a laboratory and under the excitement and enthusiasm of a semi-centennial meeting in Philadelphia, collect the money with a "hurrah," and then find a committee, writing begging letters a few years afterwards, to secure the money for its maintenance, would in my opinion be anything but complimentary to the memory of Professor Procter, and yet this has been the history of many such movements.

(2) The proposition to erect a massive bronze monument, to be placed in the City of Washington, in the Capitol Building, or the Smithsonian, is an ambitious plan, without some of the faults of the research laboratory scheme, but it has the disadvantage of being something which would be utterly repugnant to Professor Procter and it is not favored at all by the members of his family now living.

(3) The plan to establish a travelling scholarship, has an element of instability about it which is not attractive. Such a scholarship could, no doubt, be established and it might be maintained for four or five years and then the committee might probably have to send around begging letters to keep it up and the memory of William Procter would suffer to such an extent that those who subscribed would be apt to regret that they ever entertained such a project. In addition to this, Professor Procter's life was spent in building up American pharmacy, and whilst some European institutions are greatly in advance of America in teaching chemistry, it has yet to be shown that they are superior to the colleges and universities on American soil in teaching pharmacy. We must not forget that whilst Professor Procter was a chemist, pharmacy was the science which he ennobled by his writings, his teaching and his experiments.

(4) Mr. Whitney's plan of a well-designed certificate and medal to be issued by the American Pharmaceutical Association, to be awarded to worthy followers of Procter for special services or attainments, would undoubtedly be practicable, and serve to extend the influence of Procter's life amongst the present and future generations, and, in my opinion, this is the direction in which the memorial should be established, the guiding principle being to place before the young pharmacists of America the life of William Procter, and *keep it before them* as long as possible. Now, to do this, a permanent fund must be created, say $8,000 or $10,000. Let this sum be securely

invested, which would probably yield $300 per annum; this would be sufficient to found a Procter Memorial gold medal to be awarded annually to those who have rendered distinguished service to pharmacy and collateral sciences, and be the American counterpart of the British Flückiger-Hanbury medal. This sum would also permit the annual awarding of a smaller gold medal and beautifully engraved certificate to young American pharmacists by a plan like that of ex-President Whitney's. My reasons for preferring these two forms of memorials are, that in the first place the memory of William Procter would be maintained for a much longer term of years, and that the interests to which his life was devoted, *i.e.* that of pharmaceutical education, would be most directly touched and benefited by making the name and work of William Procter, household words among the present and future generations of young pharmacists; and, lastly, the plan is stable and permanent, because the principal would be secured and in hand, and the interest devoted to the objects named, *with no cost for maintenance.*

JOSEPH P. REMINGTON.

PHILADELPHIA.

DEAR SIR:—Concerning the feasibility of establishing a Research Laboratory under the auspices of the American Pharmaceutical Asssociation, I entertain so much doubt that I would rather not place myself on record except in so far that I should consider its accomplishment a great step in advance. I take this opportunity, however, to say something in reference to a "Procter Memorial." It goes without saying that I am heartily in favor of some emphatic recognition of the life-work of my dear friend and teacher, the late Prof. Wm. Procter, Jr., by the American Pharmaceutical Association, and I regard the approaching semi-centennial meeting of that association as the most fitting time for the purpose. I moreover heartily endorse the idea that the name of Wm. Procter, Jr., should be coupled with that of Edward R. Squibb, his life-long friend and most intimate co-laborer in the cause of pharmaceutical advancement. As to the character of the memorial—bearing in mind the natural modesty, earnestness of purpose, and simplicity so characteristic of both, their averseness to all ostentation—it seems to me that it would most fittingly take the shape suggested by Dr. Frederick Hoffmann, namely, "the institution of a prize medal to be granted by the American Pharmaceu-

tical Association in recognition of superior discoveries or literary accomplishments in the domain of theoretical and applied pharmaceutical sciences and arts." This medal, of appropriate and artistic design, should be simply constructed of bronze; but its award should carry with it—as something of substantial and permanent value—a life membership in the American Pharmaceutical Association, and prominent publicity in the printed proceedings of that Association.

C. LEWIS DIEHL.

LOUISVILLE, Ky.

DEAR SIR:—Concerning the research laboratory; after having revolved the matter carefully in my mind I give you herewith the benefit of my decision, if of any value whatever to you. In my opinion, a step in that direction would be desirable provided it could be inaugurated in such a way as to make it a success without any question of doubt whatever. There must be no mistake of management, there must be no error of judgment, and that we may comprehend what we have to meet in this direction in order to make the work creditable to the fiftieth anniversary of the Association, I will take the liberty of jotting down a part of the problem that has come to my mind since I began to reflect over the subject.

This research laboratory, if instituted, would have as friendly rivals, or perhaps, I might say as friendly competitors for position, the research work that is being done now in the universities of this country, the colleges of pharmacy in this country and the great manufacturing establishments. It would not be creditable to the American Pharmaceutical Association to institute a research laboratory that would not in every way meet the work done in these other directions. In order to accomplish this result a certain amount of money would be necessary. Let us not close our eyes to this fact. It is not a question of will, or wish, or hope or desire, but a question of business. A research laboratory, in order to be a research laboratory, must be conducted by men who make this work their thought, by men who have the ability to act and to do, by men who in order to have an opportunity to devote their time in this direction should be paid a salary commensurate with the responsibility they take upon themselves. It should not be a charity matter, it should not be an imposition on men who cannot afford to devote their time in this direction, but it should be in every sense of the

word a research laboratory conducted on broad grounds and conducted by men of unimpeachable education.

The question is, then, in thinking over this matter, can such a laboratory be founded? A research laboratory that will not only last for a day, or for a year, but for a period of time that will credit the laboratory established by a great society on its fiftieth anniversary of existence. In matters of this kind, the thought problem which I present herewith, is, in my opinion, the FIRST problem to consider, and in matters of this kind it strikes me, persons enthusiastic, and justly so, in behalf of the work to be accomplished should properly consider it fairly and squarely.

I will sum up by the single sentence. Admit without a question that a research laboratory for the American Pharmaceutical Association is desirable and could be made creditable and useful under proper conditions, *are the conditions such as to warrant us in moving in this direction?* Let me hope that the answer may be yes, and that the answer to this part of the question may be a reply which will make no doubt concerning the question of finances.

CINCINNATI, O. JOHN URI LLOYD.

RECENT LITERATURE RELATING TO PHARMACY.

PRESENCE OF COPPER IN NUX VOMICA.

There have recently appeared in the pharmaceutical press, reports of considerable quantity of copper found in nux vomica, even to $\frac{24}{100}$ of 1 per cent. A. Beitter (*Ber. dtsch. Ph. Ges.*, 1900, 411) discusses the subject, reporting that his examinations of nux vomica, while showing copper, indicated such minute quantities that assaying was out of the question. He found in many cases that the copper was not indicated by its well-known tests with hydrogen sulphide and with ammonia water. He, however, obtained positive results from practically every specimen of nux vomica and ignatia bean, and also from the seed of Strychnos Gaultheriana by testing with the Klunger-Schär reaction, viz.: treatment of the suspected copper compound with dilute solution of aloin, when a yellow color results. A trace of sodium chloride and gentle warming brings red color. This test he finds indicates copper in a 1 to 100,000 solution. H. V. ARNY.

EMODIN IN SENNA.

Tschirch and Hiepe (*Sch. Woch. Ch. u. Ph.*, 1900, 55) reports on the assay of senna based on the quantity of emodin contained. The results are somewhat surprising. For instance, the senna pods yield more emodin (1·15 per cent.) than the leaves (·7 to 1 per cent.). Moreover, the Alxeandria and Tripoli senna yield more emodin than the much vaunted Tinnevelly senna, the latter yielding but ·8 per cent. Frangula yields 2·6 per cent. of emodin. Cascara sagrada ·6 per cent., while rhubarb contains 1·5 per cent. This report seems to show that in the purgative drugs, save perhaps senna, emodin is not the sole active principle. H. V. A.

EXAMINATION OF COOKING OILS.

Comparing methods of distinction between olive, cotton seed, maw seed and nut oils, Kreis and Grob (*Schw. Woch. Ch. und Ph.*, 1901, 88), find Billier's reaction the best. This consists in shaking the oil with a benzol solution of resorcin and with nitric acid, under which treatment the color of olive oil is unchanged, while that of cotton-seed and nut becomes red violet, and maw seed oil is turned brown red. H. V. A.

PHARMACY LAWS AND LEGISLATION.

CONTRIBUTED BY PROF. J. H. BEAL, SCIO, O.

(Under this title it is designed to give each month a brief *résumé* of proposed and accomplished pharmacy legislation, and of decisions of importance to pharmacy boards and pharmacists. On account of space limitations, proposed legislation cannot be more than briefly mentioned, but bills enacted into law will be discussed and their principal features pointed out. Pharmacy boards and members of legislative committees and others are requested to send copies of such measures and news of this kind either to the editor of this JOURNAL, or to Prof. J. H. Beal, Scio, O.)

DECISIONS OF INTEREST TO PHARMACISTS.

An interesting decision, although along the line of decisions in similar cases, has been handed down by the Supreme Court of Iowa in the case of Burgess *vs.* The Sims Drug Company.

In this case the defendant's clerk made a mistake in the preparation of an eye lotion which resulted in the loss of an eye to the

plaintiff. The line of the defendant's argument was that he had exercised due care and caution in employing a graduate pharmacist and therefore was not responsible, citing in defense of this position that railways were not responsible for damages resulting from the negligence of their surgeons, nor banks for the mistakes of their notaries. The court denied the validity of this argument, holding that as the practice of surgery was not the province of a railway company, nor notarial services the business of a bank, these had exercised due care and skill when they had selected properly qualified surgeons and notaries, but that the filling of prescriptions being the special province of a pharmacist, the latter could not escape liability by delegating his own proper function to another person.

In the case against Maurer, of Philadelphia, for the sale of Canadian phenacetine in the United States, the United States Circuit Court, for the Eastern District of Pennsylvania, has handed down a decision affirming in general terms the validity of the Hinsberger patent. As this was generally regarded as a test case, the decision may fairly be regarded as settling the right of the patentee and his assigns to the exclusive right to sell phenacetine within the territories of the United States.

A temporary injunction has been obtained by Ralph P. Hoagland, a cutting druggist of Boston, in his suit against the Eastern Drug Company and others, to restrain them from interfering with the plaintiff's business. The allegations of the plaintiff's bill set out that the defendants have interfered with his buying and selling of drugs because he has refused to join the defendants' association which seeks to maintain prices, etc.

A recent decision of the Massachusetts Supreme Court holds that a person who pleads guilty of the illegal sale of intoxicating liquors has been "convicted" within the meaning of the law which authorizes the Board of Pharmacy to revoke the registration certificate of a druggist "convicted (for such offense) before a court of competent jurisdiction."

Two recent Cincinnati decisions regarding the sale of poisons, are of interest to pharmacists.

In one case the defendant druggist sold arsenic to a servant, a

stranger, who claimed that the poison was desired for rats, but who instead mixed the same with the breakfast oatmeal, causing the dangerous illness of those who ate of the same. The petition being demurred to, was held by the court to present a good cause of action.

In the second case a colored boy purchased "Rough on Rats" which he placed in a pot of coffee, killing his brother and nearly causing the death of his father. In deciding against the demurrer to the complaint the court held, That (under the Ohio law) the sale of a poison to a minor without a prescription renders the seller responsible to the innocent sufferer from its administration.

Coincident with the extension of the work of the N.A.R.D. came the news of suits in different parts of the country brought by cutters against the local associations for conspiracy in attempting to prevent the cutters from obtaining supplies. As the conditions are in a certain sense new, and unlike the cases in restraint of trade which have heretofore engaged the attention of the courts, the outcome of the cases will be watched with interest. The fortunes of the several suits will probably vary with the manner in which the issues have been presented by the pleadings, but it is coming to be more and more recognized that manufacturers and others have the right to require a contract from those who handle such goods to sell them at the price agreed upon, and to enforce such contracts when made.

ILLINOIS.

The Bill amending the Pharmacy Law has become a law, and will be printed in a later number of this JOURNAL.

Two other bills now pending require the formulas of proprietary medicines to be printed upon the label, and still another would require such preparations to have attached a copy of a certificate of the Board of Health, stating that the preparation has been examined by the Board, that it is harmless, and an appropriate remedy for the disease for which it is recommended.

The so-called "Soda Fountain Bill" which sought to regulate the structure of soda fountains and the manner of keeping syrups, etc., has been defeated, as it ought to have been. The benefits to be derived from such a law are largely, if not altogether, imaginary, the injury done by it would have been real and immense.

NEW YORK.

The bill to regulate the storage of explosive and combustible substances in the city of New York, mentioned in the May number of this JOURNAL, after passing both houses of the Legislature was vetoed by the Governor on the ground that its provisions are already embraced in the new charter which is to take effect January 1, 1902.

The Costello Bill, previously mentioned in this JOURNAL, has been enacted into law. While in some respects the bill is not far from justice, as a whole it is not to be commended. It permits the dispensing of medicines by physicians, allows general dealers to sell domestic remedies, and authorizes the State Board to grant permits without examination to persons having experience in dealing in drugs and medicines to compound and dispense upon payment of an annual fee of $3.00. The text of the bill will be given in a later issue.

PENNSYLVANIA.

A recently enacted law prohibits the distribution of trial samples of medicines, dyes, inks, etc., in such form or manner as will permit them to come easily into the hands of children, but does not interfere with the distribution of such articles directly to adults.

OTHER NEW LAWS.

Other laws have been enacted in California, Rhode Island, and Nevada. The latter is quite a comprehensive measure, and presents a number of commendable features. It is intended to print these laws in full in a subsequent number of this JOURNAL.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

ANNUAL AND ANALYTICAL CYCLOPÆDIA OF PRACTICAL MEDICINE. By Charles E. de M. Sajous and one hundred associate editors, assisted by corresponding editors, collaborators and correspondents. Illustrated with chromo-lithographs, engravings and maps. Vol. VI. Philadelphia, New York, Chicago: F. A. Davis Company. 1901.

This volume is the last of the first series and contains, like

the preceding volumes, a large number of valuable articles. Among these may be mentioned: "Rheumatism," by F. Levison; "Diseases of the Stomach," by D. D. Stewart; "Surgery of the Stomach and Intestines," by W. W. Keen and M. B. Tinker; "Surgery of the Spine," by R. H. Sayre; "Syphilis," by G. F. Lydston; "Surgery of the Urinary System," by J. W. White and A. C. Wood; "Diseases of the Uterus," by H. T. Byford; "Diseases of the Uterine Adnexa," by E. E. Montgomery; Wounds and Injuries of the Chest," by L. A. Stimson and E. L. Keyes, Jr., and "Yellow Fever," by W. Wyman.

These remarkable books are probably not duplicated in medicine, as they contain not only what is usual in books on practice of medicine, but considerable space is devoted to surgical subjects. The progress of the past decade is recorded and in many instances original work was instituted to solve the problems that the research workers had not as yet attempted. The various specialties have received consideration, the newer the rapeutics has been introduced and, in short, everything has been done to make the work an original, valuable and advanced encyclopædia of the entire field of practical medicine. The general index accompanying this volume is a model of its kind, and illustrates how much matter is usually lost sight of in the encyclopædic works because of this lack of systematic arrangement. There have been few books so ably edited, so full of information, and so arranged that every subject on which information is desired may be readily consulted.

NOTES ON EQUATION WRITING AND CHEMICAL AND PHARMACEUTICAL ARITHMETIC. Second edition, revised and enlarged. By J. H. Beal. Pittsburg: The Calumet Publishing Company.

The first edition of this book was published by the author for the benefit of his students, without any thought of a more extended circulation. But as with all books on such subjects, if there is anything to commend them, they are likely to be used in a much wider sphere than is anticipated. This is the case with Beal's "Equation Writing and Chemical and Pharmaceutical Arithmetic." The work is a good pharmaceutical stoichiometry, and the chapters on equation writing will make the work of such value that it will doubtless replace Barker's "Chemistry," for this purpose, which has so long been used by students beginning the study of chemistry.

The work consists of: Part I—Equation Writing; (1) General Principles; (2 and 3) Nomenclature, Notation and Classification of the Elements, and Inorganic Compounds; (4) the Writing of Chemical Formulæ; (5) Construction and Interpretation of Equations; (6) Oxidation and Reduction, Spelling and Pronunciation of Chemical Terms. Part II—Chemical and Pharmaceutical Arithmetic; (7) Important Data Employed in the Problems in Part II; (8) Calculations Based on Chemical Formulæ; (9) Calculations Based on Equations; (10) Calculations Involving the Weights and Volumes of Gases; (11) Calculations Involving the Weights, Volumes and Specific Gravities of Liquids and Solids; (12) Percentage Solutions and Mixtures; (13) Alligation or Adjustment of Percentages and Specific Gravities.

There are a number of new things in the book, or rather a new way of treating modern facts and theories, as in the use of the term Microcrith; the nomenclature of alkaloidal salts; the theory of doubled formulæ, etc. The book is one which not only beginners in chemistry will use with profit, but teachers and others will enjoy having, as there is a good deal of valuable matter contained therein.

OBITUARY.

HANS M. WILDER.

Hans M. Wilder was born in the island of Iceland in March, 1831. His parents were Danes and lived in the city of Copenhagen, Hans having been born while his parents were on a visit to Iceland. He spent his boyhood in Denmark, entering the gymnasium when he was five years old. In his eleventh year he was transferred to the Latin school. On account of his father's death, and the straitened circumstances of the family, he was unable to continue at school, and he was therefore apprenticed to an apothecary; at the end of four years he took his junior examination, and three and a half years afterwards passed his Major Candidatus. While still a clerk in the drug store his mother died, and soon after with a small sum of money which had been bequeathed to him, he began to satisfy his roving disposition, going first to France, where he stayed six months with a relative in Rheims. After travelling through France he set sail for St. Croix, West Indies, and after being here three years he sailed for the United States in 1860, land-

ing in Philadelphia. He subsequently travelled from Chicago down the Mississippi on a steamboat to New Orleans.

In 1861 he returned to New York, and in 1863 he sailed for Puerto Plata, San Domingo. He was present in this island during one of the periodical revolts, and had some hairbreadth escapes, sailed for New York, and subsequently, in Philadelphia, enlisted as a surgeon steward on the "Tunxis" (a light draft monitor). He did not relish a life on the monitor, and going ashore, enlisted in Company I, Thirty-fourth New Jersey Regiment, and was sent to Cairo, Ill. From here the Army of the Gulf went to New Orleans, but before Hans Wilder saw a battle he was taken ill, and sent home from Mobile Bay to New York.

Soon after he went to Chicago, where he was employed as a drug clerk in different stores for two years. He then returned to New York, and sailed for San Francisco, and upon his arrival here he determined to try silver mining at Silver City, Nev. He was a silver miner for half a day, then went back to the drug business; but he was only three months in his position before he returned to San Francisco, and a few months afterward he was a sailor before the mast on his way to Liverpool.

From here he went to Copenhagen, only to remain a short time, when he left for Philadelphia in 1868; here he bought a drug store on Girard Avenue, which he sold out soon afterward, and bought another at Fifth and Poplar Streets; this he sold out in 1876, and then went again to New York as relief clerk.

From 1879 to 1881 he was the clerk of the College of Pharmacy in the city of New York, then travelled to Detroit, Chicago, Cincinnati and Louisville, and was called back to Detroit to edit the *New Idea* for Frederick Stearns & Co. He stayed here for two years, and then returned to Philadelphia, where he died January 25, 1901.

Hans M. Wilder was a pharmacist of ability, and he had rare linguistic talents. He was particularly fond of making indexes and abstracts from journals, having compiled indexes for the AMERICAN JOURNAL OF PHARMACY, *Proceedings of the American Pharmaceutical Association*, and other scientific bodies. He frequently contributed articles to the pharmaceutical journals; "Polyhistor" was his *nom de plume*, and he was engaged for two years as a writer for the *Druggists' Circular*. Probably his most remarkable achievement was

the cataloguing and arranging of coin collections. His knowledge of various languages was of great assistance here, while his careful, accurate pharmaceutical habits were of much assistance in training for this work.

His was a familiar figure in the halls of the Philadelphia College of Pharmacy, and he had an excellent working knowledge of pharmaceutical and medical books in all languages. He was unmarried, and up to the time of his death enjoyed good health. He died suddenly in the library of the American Philosophical Society, January 25, 1901, of a stroke of apoplexy, His sorrowing friends took charge of the remains, which now lie peacefully in Northwood Cemetery, Philadelphia. J. P. R.

DR. LAWRENCE TURNBULL.

On October 24, 1900, this eminent medical practitioner passed away at his home, in this city. He was born in Shotts, Lanarkshire, Scotland, in 1821. At the age of 17 he came to America and shortly thereafter engaged in the drug business with John Bringhurst. He entered the Philadelphia College of Pharmacy and was graduated therefrom in 1842. His inaugural thesis was a meritorious paper upon the bark of the American Aspen, Populus tremuloides, his investigation proving the presence of salicin as the active constituent (AMERICAN JOURNAL OF PHARMACY 1843, page 275).

Subsequently, he was employed in the chemical laboratory of the late Frederick Brown, and while engaged there he published several contributions to pharmaceutical literature. His formulas for the preparation of the scale salts of citrate of iron and citrate of iron and quinine, which have since become popular remedies, attracted considerable attention and in recognition of his skill the Franklin Institute awarded him a certificate of merit. Dr. Turnbull is credited with the discovery of the bleaching effect of sodium borate upon ointments and oils.

Deciding upon the study of medicine he secured as his preceptor Dr. John K. Mitchell and was graduated in 1845 from the Jefferson Medical College.

For several winters he lectured at the Franklin Institute on chemistry as applied to the arts.

In 1850, the chair of Materia Medica in the Philadelphia College of Pharmacy became vacant by the resignation of Professor Joseph

Carson and Dr. Lawrence Turnbull was mentioned as a candidate to fill the vacancy.

He selected as his special field of study the diseases affecting the ear, and soon became recognized as an authority in this department by such able surgeons as Professor D. Hayes Agnew and Professor Samuel D. Gross.

He took great pleasure in establishing this department of tuition in the Jefferson Medical College. For many years, he was also connected with the Department of Diseases of Eye and Ear at the Howard Hospital.

Dr. Turnbull contributed a number of valuable papers to medical literature and also several text-books on diseases of the ear and aural surgery which have been standard works and have added greatly to his established international reputation as an authority on Otology.

While only a short period of his life was occupied with the duties of the apothecary, yet in the sphere of the pharmacist his ability received the first recognition. His training in pharmacy and chemistry, undoubtedly, whetted his appetite for study and his ability for keen observation that were prominent characteristics in his after success.

G. M. B.

WILLIAM R. WARNER.

William Richard Warner was born on December 25, 1836, in Caroline County, Maryland. His parents dying when he was quite young, he lived with an uncle for a short time, when the uncle likewise died and thus William was thrown on his own resources at a very early age.

He obtained a rudimentary education in a country school and a limited course in the academy at Easton, Md.

He entered the employ of Chamberlain & Anderson, druggists, of Easton, Md., and assiduously applied himself to mastering the details of his chosen calling. He roomed in the loft over the store and fortunately he found stored away here, a number of valuable scientific books. With a yearning for more extensive acquaintance with the sciences, William was not slow to take advantage of this fortunate circumstance. The natural bent of his mind was demonstrated and we find him studying geology, botany, palæontology and chemistry and applying them practically to his surroundings.

While a mere youth he is said to have contributed to the local

papers, several contributions on scientific subjects. He possessed considerable skill as a taxidermist and made extensive collections of birds.

Entering the Philadelphia College of Pharmacy, he was graduated therefrom in 1856 and immediately engaged on a lecturing tour through Pennsylvania, delivering a series of lectures on chemical physics.

Mr. Warner opened a store at Second and Girard Avenue. Being ambitious, he was not content with the retail business and gradually engaged in manufacturing, and selling out his retail business, he now located at 154 North Third Street as a wholesaler. He engaged extensively in the manufacture of sugar-coated pills and granules and sought foreign as well as home markets for his products.

In 1876, the firm removed to a six-story building, 1228 Market Street, and there engaged in manufacturing a more extended line of pharmaceuticals. This building becoming inadequate for their manufacturing business, a lot at Broad and Wallace Streets was procured and a ten-story building, known as "Warner Hall," was erected. Here the laboratories were established and after the disastrous fire in 1899, which destroyed their Market Street building, the entire business of the firm was removed to this place.

Wm. R. Warner joined the Philadelphia College of Pharmacy in 1858 and was a life member. For several years after graduating from the College he took quite an interest in matters relating to scientific pharmacy and contributed a number of articles to pharmaceutical literature, ten papers appearing in the AMERICAN JOURNAL OF PHARMACY. For several years he served on the Herbarium Committee, associated with the late Prof. John M. Maisch. Later, the details of business engrossed his thoughts and here he exhibited the same energy and avidity for mastering the problems of commerce and manufacture. He was also the possessor of a valuable collection of paintings, especially rich in portraits of noted men.

Wm. R. Warner was taken ill in New York while on a business trip and was brought home suffering from a general collapse. After suffering for three weeks he was striken with a second stroke of paralysis on the morning of April 3d and died in a short time. He is survived by three sons, who will continue the business of manufacturing pharmacists under the old firm title. G. M. B.

AUGUST WEBER.

Mr. August Weber, who was a member of the College for many years, died March 7, 1901, at the age of 63 years. He was born at Hessen-Darmstadt, July 12, 1838. He was educated in Germany, and entered a drug store to learn the business. He pursued his studies in chemistry and pharmacy at the University of Giesen, graduating from that institution. He came to this country in 1857, and went to Allentown, where he took charge of Mr. Clump's drug store. He moved to Ashland in 1861, and three years later came to Philadelphia, where he opened a drug store at 634 Washington Avenue. In 1866 he removed to the corner of Sixth Street and Washington Avenue, where he successfully carried on his business till the time of his death. He became a member of the College June 4, 1872, and while prevented by his duties from attending its meetings, he always took a lively interest in pharmacy, and spent considerable time in reading the literature related to that subject. Mr. Weber was exceedingly conscientious and exact in all his work and dealings, a good and kind husband and father, upright and just and respected by all who knew him. In the spring of 1897 Mr. Weber had an attack of sickness, and by the advice of his physician went abroad and spent several months in his native land, seeking rest and renewed strength. He returned much benefited, and was able to resume his duties up to the present year, when he was stricken with paralysis, which, in a short time, was followed by his death. He leaves a widow and five sons and a daughter. One of his sons, Herman Weber, continues the business. G. P.

JAMES G. WELLS.

James G. Wells was born June 24, 1839, near Port Kennedy, in Norriton Township, about two miles from Norristown, Pa. His parents were William Ellis and Hepsey (Norris) Wells. He was a descendant of Isaac Norris, who was the close friend of William Penn, and owner of the greater part of Norriton Township, includ- the present site of Norristown.

His father died while he was quite young, and the family subsequently removed to Norristown. He was educated at the school of Rev. Samuel Aaron, in Norristown.

In 1856 he came to Philadelphia and engaged in the drug business with David Stackhouse, at Eighth and Green Streets, and enter-

ing the Philadelphia College of Pharmacy he was graduated therefrom in 1860. In August, 1862, he entered the Union Army as Hospital Steward of the 138th Regiment of Pennsylvania Volunteers, and served as such until the close of the war.

He then secured the drug store at Ninth and Spring Garden Streets. He was a man of sterling qualities, and successfully conducted his business here for twenty-eight years, when he disposed of his store and retired.

Mr. Wells joined the Philadelphia College of Pharmacy in 1872, and was a life member. He was a prominent Mason, and a member of Post No. 2, G. A. R. He was a director of the People's Bank. He was greatly interested in the work of the Spring Garden Soup Society, of which he was President for many years.

Mr. Wells married Elizabeth, daughter of Isaac and Elizabeth Walker, of Chester Valley, who, with one daughter, Hepsey Norris Wells, survives him.

For several years Mr. Wells had been in declining health, and had two slight strokes of paralysis within a year. He died suddenly on July 19, 1900, of angina pectoris, in Chester Valley, where he and his wife and daughter had been accustomed to spend the summer months.

C. A. W.

PHILADELPHIA COLLEGE OF PHARMACY.

The quarterly meeting of the members of the Philadelphia College of Pharmacy was held June 24, 1901, the President, Howard B. French, in the chair; twenty-five members were present. The minutes of the annual meeting, held March 25th, were read and approved as read.

The minutes of the meeting of the Board of Trustees for April and May were read by the Registrar, W. Nelson Stem, and approved as read. The minutes of the June meeting were not read, the President ruling that as they had not been approved by the Board it would be premature for the College to approve them.

Mr. Beringer, for the Committee on Necrology, presented the report for the year. He stated that he had been assisted by other members of the College and would read the memoirs except that of Dr. E. R. Squibb by title, and moved their acceptance and that they be referred to the editor of the JOURNAL for publication. So ordered.

Memoirs were presented of August Weber, prepared by Gustavus Pile; of Wm. R. Warner and Dr. Lawrence Turnbull, prepared by George M. Beringer; James G. Wells, prepared by Dr. C. A. Weidemann; of Dr. E. R. Squibb and Hans M. Wilder, by Prof. Joseph P. Remington; of Dr. Theodore Husemann, by Prof. Henry Kraemer.

The Committee on Resolutions on the death of Dr. Charles Rice, consisting

of Messrs. Remington, Beringer and Kraemer, presented the following, which was adopted :

WHEREAS, The Philadelphia College of Pharmacy has learned of the death on Monday, May 13, 1901, of our esteemed honorary member, Charles Rice, Ph.D., Ph.M., Chairman of the Committee of Revision of the United States Pharmacopœia, be it therefore,

Resolved, That we hereby express our appreciation of his great natural ability, scholarly attainments and nobleness of character, which not only gained for him the profound admiration of the pharmaceutical and medical professions throughout the world, but which endeared him to all who either came in contact with him personally or who had more remote relations with him.

The enormous amount of efficient work that he accomplished on the United States Pharmacopœia during the last twenty years as Chairman of the Revision Committee has done much toward elevating our national standard to its acknowledged advanced scientific standing. His personality is indelibly impressed on its pages and his influence will extend throughout future revisions, and thus continue to attest his especial fitness for conducting Pharmacopœial work.

Perfection of style, simplicity and thoroughness have always characterized his contributions to pharmaceutical literature, and not less marked has been his willingness to sacrifice time, efforts and means to advance the interests of his profession.

The results accomplished during his life remain as a lasting memorial, more impressive than any monument in his honor, and one which will always appeal to the pharmacist as an ideal worthy of our emulation.

Resolved, That the officers and members of the Philadelphia College of Pharmacy by this memorial minute, desire to express their profound sorrow at the removal by death of this unselfish and zealous worker in the field of pharmacy, and to record their admiration for the personal character and services of Dr. Charles Rice, and with it their appreciation of the immeasurable loss which American pharmacy has sustained by his demise, a loss which must be severely felt throughout the pharmaceutical world.

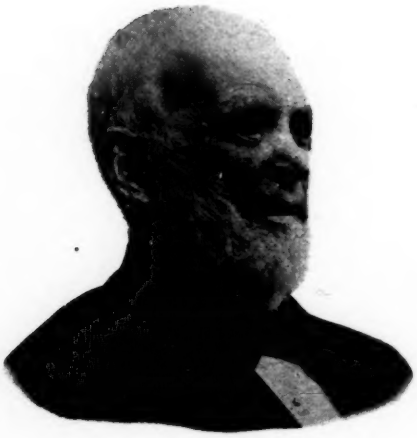
The President appointed the following committees : Committee on Necrology, George M. Beringer, Prof. Henry Kraemer, Gustavus Pile. Committee on Nominations, Joseph W. England, Harry L. Stiles, Jacob M. Baer, Theodore Campbell, Henry C. Blair.

Dr. C. B. Lowe alluded to the botanical specimens gathered in the vicinity of Washington, Pa., by Mr. Isaac M. Weills, and donated to the College by him, and moved that a vote of thanks be tendered the donor, which was adopted.

Communications were read from Charles Mohr, of Asheville, N. C., Helen Abbott Michael, of Boston, Mass., and Prof. Dr. Arthur Meyer, of Marburg, Germany, acknowledging receipt of notification of their election to honorary membership in the College. Professor Kraemer also read a portion of a letter from Dr. Charles Rice which he received a short time before his death, in which he expressed his appreciation of his election as an honorary member in this College.

Two applications for membership were received and referred to appropriate committees.

C. A. WEIDEMANN, M.D.,
Secretary.



EDWARD ROBINSON SQUIBB, M.D.